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09/885,134	06/21/2001	Yuichi Suzuki	NE-1059-US	3084

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YOUNG & THOMPSON
745 SOUTH 23RD STREET 2ND FLOOR
ARLINGTON, VA 22202

EXAMINER	
LOHN, JOSHUA A	

ART UNIT	PAPER NUMBER
2114	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/885,134	Applicant(s) SUZUKI ET AL.	
	Examiner Joshua A Lohn	Art Unit 2114	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 14 recites the limitation "said fault indication of the outgoing line card". There is insufficient antecedent basis for this limitation in the claim. The claim should depend from claim 12 instead of claim 11 to overcome this rejection

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Monastra et al., United States Patent Number 5,361,249, published November 1, 1994.

As per claim 1, Monastra discloses a method of routing traffic from each of a plurality of incoming line cards to one of a plurality of outgoing line cards to which transmission lines are connected, see figure 3. Monastra also discloses monitoring the outgoing transmission lines, see column 5, lines 6-18, and communicating a fault indication to all of the incoming line cards if a fault condition is detected in at least one of the outgoing transmission lines, see column 14, lines 50-57. Monastra further discloses updating a routing table at each of the incoming line cards according to the fault indication so that packets from the incoming line cards are routed to

normally operating outgoing transmission lines, see column 14, lines 50-68, where multiplexors provide routing information.

As per claim 2, Monastra teaches monitoring the outgoing line cards, see column 5, lines 6-18, where monitoring detects all problems with the bits in line cards, communicating a fault indication to all of the incoming line cards if a fault condition is detected in at least one of the outgoing line cards, see column 14, lines 50-57, and updating a routing table at each of the incoming line cards according to the fault indication so that packets from the incoming line cards are routed to normally operating outgoing line cards, see column 14, lines 50-68, where the routing table is adjusted to utilize these spare channels and a normally operating outgoing line card is provided through the use of spare bit channels.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 5, 7, 8, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krishna et al., "On the Speedup Required for Work-Conserving Crossbar Switches", published June 1999, in view of Monastra.

As per claim 3, Krishna discloses a typical crossbar switch architecture, see section "II. High Level Description of the Architecture", that includes: routing traffic from each of a plurality of incoming line cards to one of a plurality of outgoing line cards to which outgoing

transmission lines are connected; receiving, at each of the incoming line cards a packet from one of the incoming transmission lines, which are inherent in the receipt of the variable length packets because a line must have been used to transmit them to the input-line card; converting the packet into at least one intra-node cell of fixed data length and forwarding the cell to the switch so that the cell is routed to the output port, receiving intra-node cells from the self-routing switch, converting the cells into a packet; forwarding the packet to an outgoing transmission line. Krishna also discloses determining an output port of a self-routing switch based on an address contained in the packet by using routing information stored in the routing table, see the use of the arbiter for routing in section II. Krishna fails to disclose monitoring the outgoing transmission lines and communication fault information.

Monastra discloses monitoring the outgoing transmission lines, see column 5, lines 6-18, and communicating a fault indication to all of the incoming line cards if a fault condition is detected in at least one of the outgoing transmission lines, see column 14, lines 50-57. Monastra further discloses updating a routing table at each of the incoming line cards according to the fault indication so that packets from the incoming line cards are routed to normally operating outgoing transmission lines, see column 14, lines 50-68, where multiplexors provide additional routing information.

It would have been obvious to one skilled in the art at the time of the invention to use the fault detection means of Monastra in the crossbar switch of Krishna.

This would have been obvious because the disclosure of Krishna teaches of a switch performing basic operations, see section II. The invention of Monastra teaches of a method of making a fault tolerant switching system. It is well known in the art that it is beneficial to be

able to overcome failures in a switching system, and the invention of Monastra provides an improved system of fault tolerance that provides redundancy with the additional obvious benefit of cost effectiveness, see column 2, lines 29-62. It would have been obvious to implement the invention of Monastra into the switch of Krishna to provide the obvious benefit of cost-effective fault tolerance in the switch.

As per claim 5, Monastra teaches monitoring the outgoing line cards, see column 5, lines 6-18, where monitoring detects all problems with the bits in line cards, communicating a fault indication to all of the incoming line cards if a fault condition is detected in at least one of the outgoing line cards, see column 14, lines 50-57, and updating a routing table at each of the incoming line cards according to the fault indication so that packets from the incoming line cards are routed to normally operating outgoing line cards, see column 14, lines 50-68, where the routing table is adjusted to utilize these spare channels and a normally operating outgoing line card is provided through the use of spare bit channels.

As per claim 7, Krishna discloses a typical crossbar switch architecture, see section "II. High Level Description of the Architecture", that includes: routing traffic from each of a plurality of incoming line cards to one of a plurality of outgoing line cards to which outgoing transmission lines are connected; receiving, at each of the incoming line cards a packet from one of the incoming transmission lines, which are inherent in the receipt of the variable length packets because a line must have been used to transmit them to the input-line card; converting the packet into at least one intra-node cell of fixed data length and forwarding the cell to the switch so that the cell is routed to the output port, receiving intra-node cells from the self-routing switch, converting the cells into a packet; forwarding the packet to an outgoing transmission line.

Krishna also discloses determining an output port of a self-routing switch based on an address contained in the packet by using routing information stored in the routing table, see the use of the arbiter for routing in section II. Krishna fails to disclose monitoring the outgoing transmission lines and communication fault information.

Monastra discloses monitoring the outgoing transmission lines, see column 5, lines 6-18, and communicating a fault indication to all of the incoming line cards if a fault condition is detected in at least one of the outgoing transmission lines, see column 14, lines 50-57. Monastra further discloses updating a routing table at each of the incoming line cards to the fault indication so that packets from the incoming line cards are routed to normally operating outgoing transmission lines, see column 14, lines 50-68, where multiplexors provide additional routing information.

It would have been obvious to one skilled in the art at the time of the invention to use the fault detection means of Monastra in the crossbar switch of Krishna.

This would have been obvious because the disclosure of Krishna teaches of a switch performing basic operations, see section II. The invention of Monastra teaches of a method of making a fault tolerant switching system. It is well known in the art that it is beneficial to be able to overcome failures in a switching system, and the invention of Monastra provides an improved system of fault tolerance that provides redundancy with the additional obvious benefit of cost effectiveness, see column 2, lines 29-62. It would have been obvious to implement the invention of Monastra into the switch of Krishna to provide the obvious benefit of cost-effective fault tolerance in the switch.

As per claim 8, Monastra teaches outgoing line cards configured for monitoring, see column 5, lines 6-18, where monitoring detects all problems with the bits in line cards, communicating a fault indication to all of the incoming line cards if a fault condition is detected in at least one of the outgoing line cards, see column 14, lines 50-57, and updating a routing table at each of the incoming line cards according to the fault indication so that packets from the incoming line cards are routed to normally operating outgoing line cards, see column 14, lines 50-68, where the routing table is adjusted to utilize these spare channels and a normally operating outgoing line card is provided through the use of spare bit channels.

As per claim 11, Krishna discloses a typical crossbar switch architecture, see section "II. High Level Description of the Architecture", that includes: routing traffic from each of a plurality of incoming line cards to one of a plurality of outgoing line cards to which outgoing transmission lines are connected; receiving, at each of the incoming line cards a packet from one of the incoming transmission lines, which are inherent in the receipt of the variable length packets because a line must have been used to transmit them to the input-line card; converting the packet into at least one intra-node cell of fixed data length and forwarding the cell to the switch so that the cell is routed to the output port, receiving intra-node cells from the self-routing switch, converting the cells into a packet; forwarding the packet to an outgoing transmission line. Krishna also discloses determining an output port of a self-routing switch based on an address contained in the packet by using routing information stored in the routing table, see the use of the arbiter for routing in section II. Krishna discloses an interface having an input terminal connected to a corresponding one of the output ports of the switch and a plurality of output terminals for distributing the received intra-node cells, see the connection on the output side of

the switch that connects to the outgoing link. Krishna also discloses a plurality of packet assemblers existing for the reassembly of cells at the output of the switch, all also in section II. Krishna fails to disclose monitoring the outgoing transmission lines and communication fault information.

Monastra discloses monitoring the outgoing transmission lines, see column 5, lines 6-18, and communicating a fault indication to all of the incoming line cards if a fault condition is detected in at least one of the outgoing transmission lines, see column 14, lines 50-57. Monastra further discloses updating a routing table at each of the incoming line cards to the fault indication so that packets from the incoming line cards are routed to normally operating outgoing transmission lines, see column 14, lines 50-68, where multiplexors provide additional routing information.

It would have been obvious to one skilled in the art at the time of the invention to use the fault detection means of Monastra in the crossbar switch of Krishna.

This would have been obvious because the disclosure of Krishna teaches of a switch performing basic operations, see section II. The invention of Monastra teaches of a method of making a fault tolerant switching system. It is well known in the art that it is beneficial to be able to overcome failures in a switching system, and the invention of Monastra provides an improved system of fault tolerance that provides redundancy with the additional obvious benefit of cost effectiveness, see column 2, lines 29-62. It would have been obvious to implement the invention of Monastra into the switch of Krishna to provide the obvious benefit of cost-effective fault tolerance in the switch.

As per claim12, Monastra teaches outgoing line cards configured for monitoring, see column 5, lines 6-18, where monitoring detects all problems with the bits in line cards, communicating a fault indication to all of the incoming line cards if a fault condition is detected in at least one of the outgoing line cards, see column 14, lines 50-57, and updating a routing table at each of the incoming line cards according to the fault indication so that packets from the incoming line cards are routed to normally operating outgoing line cards, see column 14, lines 50-68, where the routing table is adjusted to utilize these spare channels and a normally operating outgoing line card is provided through the use of spare bit channels.

Claims 4, 6, 9, 10, and 13 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krishna in view of Monastra, in further view of Watanabe, United States Patent 6,246,665, filed December 24,1996.

As per claim 4, Monastra and Krishna fail to disclose communicating the fault indication via the self-routing switch.

Watanabe discloses communicating a fault indication via a self routing switch of a failure, where failures include those of cards and lines, see column 14, lines 18-22, where the interface unit generates an alarm cell to transmit notification of the failure through the switch to all the other units, see column 12, lines 9-16 and 28-55.

It would have been obvious to one skilled in the art at the time of the invention to use the fault notification methods of Watanabe in the system of Monastra and Krishna.

This would have been obvious because Monastra discloses the benefits of reducing the number of bits required for error detection, to allow for more compensation of defective bits, but

also discloses a desire to maintain efficient error detection, see column 9, lines 25-45. Watanabe discloses a means for efficient error detection that does not require dedicated bits. The use of the various error detection modules to detect errors in the lines and the interfaces, see column 14, lines 42-52. Allows for the use of alarm messages to provide universal detection of errors without the requirement of any additional lines for error detection. The use of the dedicated hardware modules provides the obvious benefit of an additional alternative for error detection as desired by Monastra, see column 9, lines 25-45.

As per claim 6, this claim is rejected under the same grounds as claim 4, mentioned previously.

As per claim 9, Monastra and Krishna fail to disclose communicating the fault indication via the self-routing switch.

Watanabe discloses communicating a fault indication via a self routing switch of a failure, where failures include those of cards and lines, see column 14, lines 18-22, where all the interface units are configured to generate an alarm cell to transmit notification of the failure through the switch to all the other units, see column 12, lines 9-16 and 28-55.

It would have been obvious to one skilled in the art at the time of the invention to use the fault notification methods of Watanabe in the system of Monastra and Krishna.

This would have been obvious because Monastra discloses the benefits of reducing the number of bits required for error detection, to allow for more compensation of defective bits, but also discloses a desire to maintain efficient error detection, see column 9, lines 25-45. Watanabe discloses a means for efficient error detection that does not require dedicated bits. The use of the various error detection modules to detect errors in the lines and the interfaces, see column 14,

lines 42-52. Allows for the use of alarm messages to provide universal detection of errors without the requirement of any additional lines for error detection. The use of the dedicated hardware modules provides the obvious benefit of an additional alternative for error detection as desired by Monastra, see column 9, lines 25-45.

As per claim 10, this claim is rejected under the same grounds as claim 9, mentioned previously.

As per claim 13, Monastra and Krishna fail to disclose communicating the fault indication via the self-routing switch.

Watanabe discloses communicating a fault indication via a self routing switch of a failure, where failures include those of cards and lines, see column 14, lines 18-22, where all the interface units are configured to generate an alarm cell to transmit notification of the failure through the switch to all the other units, see column 12, lines 9-16 and 28-55.

It would have been obvious to one skilled in the art at the time of the invention to use the fault notification methods of Watanabe in the system of Monastra and Krishna.

This would have been obvious because Monastra discloses the benefits of reducing the number of bits required for error detection, to allow for more compensation of defective bits, but also discloses a desire to maintain efficient error detection, see column 9, lines 25-45. Watanabe discloses a means for efficient error detection that does not require dedicated bits. The use of the various error detection modules to detect errors in the lines and the interfaces, see column 14, lines 42-52. Allows for the use of alarm messages to provide universal detection of errors without the requirement of any additional lines for error detection. The use of the dedicated

hardware modules provides the obvious benefit of an additional alternative for error detection as desired by Monastra, see column 9, lines 25-45.

As per claim 14, this claim would be rejected under the same grounds as those of claim 13 if the claim is amended to depend from 12 as appears to be the applicant's intent.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is provided on form PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua A Lohn whose telephone number is (703) 305-3188. The examiner can normally be reached on M-F 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoleil can be reached on (703) 305-9713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JAL

SCOTT BADERMAN
PRIMARY EXAMINER